

Title (en)  
Photodiode with high quantum efficiency

Title (de)  
Fotodiode mit hoher Quanteneffizienz

Title (fr)  
Photodiode à haut rendement quantique

Publication  
**EP 2840614 A1 20150225 (FR)**

Application  
**EP 14181921 A 20140822**

Priority  
FR 1358138 A 20130823

Abstract (en)  
[origin: US2015054042A1] A photodiode includes at least one central pad arranged on a light-receiving surface of a photodiode semiconductor substrate. The pad is made of a first material and includes lateral sidewalls surrounded by a spacer made of a second material having a different optical index than the first material. The lateral dimensions of the pad are smaller than an operating wavelength of the photodiode. Both the first and second materials are transparent to that operating wavelength. The pads and spacers are formed at a same time gate electrodes and sidewall spacers of MOS transistors are formed.

Abstract (fr)  
L'invention concerne une photodiode comprenant au moins un plot central (20) disposé sur la surface photo-réceptrice de la photodiode, le plot étant en un premier matériau dont les parois latérales sont entourées d'au moins un espaceur (22) en un deuxième matériau d'indice optique distinct de celui du premier matériau, les dimensions latérales du plot étant inférieures à la longueur d'onde de fonctionnement de la photodiode, les premier et deuxième matériaux étant transparents à la longueur d'onde de fonctionnement.

IPC 8 full level  
**H01L 31/0232** (2014.01); **H01L 27/146** (2006.01); **H01L 31/107** (2006.01)

CPC (source: EP US)  
**H01L 27/1443** (2013.01 - US); **H01L 27/14625** (2013.01 - EP US); **H01L 27/14643** (2013.01 - EP US); **H01L 27/14689** (2013.01 - EP US); **H01L 29/16** (2013.01 - US); **H01L 29/4916** (2013.01 - US); **H01L 29/6656** (2013.01 - US); **H01L 31/02327** (2013.01 - EP US); **H01L 31/1016** (2013.01 - US); **H01L 31/107** (2013.01 - EP US); **H01L 31/1804** (2013.01 - US)

Citation (applicant)  
WO 2012032495 A1 20120315 - COMMISSARIAT ENERGIE ATOMIQUE [FR], et al

Citation (search report)  
• [X] US 2012267694 A1 20121025 - KAISER DIETER [DE], et al  
• [I] EP 2144303 A1 20100113 - ST MICROELECTRONICS RES & DEV [GB]  
• [X] US 2008121781 A1 20080529 - BOETTIGER ULRICH C [US]  
• [AD] WO 2012032495 A1 20120315 - COMMISSARIAT ENERGIE ATOMIQUE [FR], et al  
• [A] US 2006012001 A1 20060119 - KIM IN S [KR]  
• [A] KR 20020045162 A 20020619 - HYNIX SEMICONDUCTOR INC [KR]

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Designated contracting state (EPC)  
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

Designated extension state (EPC)  
BA ME

DOCDB simple family (publication)  
**EP 2840614 A1 20150225; EP 2840614 B1 20170906**; EP 2975650 A1 20160120; FR 3009889 A1 20150227; FR 3009889 B1 20161223; US 2015054042 A1 20150226; US 9450000 B2 20160920

DOCDB simple family (application)  
**EP 14181921 A 20140822**; EP 15182078 A 20140822; FR 1358138 A 20130823; US 201414462724 A 20140819